Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

ORIGINAL

DOCKET FILE COPY ORIGINAL

In the Matter of	)	
	)	
Amendment of Part 18 of the Commission's	)	RM-9514
Rules to Update ISM Regulations	)	
And Promote Deployment of New,	)	
High Bandwidth Communications Devices	)	

REPLY COMMENTS OF THE MILLIMETER WAVE COMMUNICATIONS WORKING GROUP

The Millimeter Wave Communications Working Group (the "MWCWG"), by its attorneys, hereby responds to the comments on and oppositions to the above-referenced petition for rulemaking (the "Petition"), which was filed by the MWCWG on March 2, 1999.

The MWCWG's proposal attempts to balance the needs of two important spectrum uses: ISM applications and a new class of broadband, low-power wireless communications technologies. In doing so, MWCWG pointed out:

- that unrestricted ISM emissions pose a risk of severe interference to low-power communications technologies operating in the 59-64 GHz band;
- that even the threat of ISM interference will have a detrimental effect on the development of millimeter wave communications technologies;
- that the 59-64 GHz band is uniquely valuable as a contiguous 5 GHz of unlicensed spectrum, which would be squandered if interference from ISM were, in effect, to cut it in half; and
- that the adoption of reasonable in-band emission limits for ISM devices is both consistent with the conditions under which the international community made the 61.25 GHz band available for ISM use and not unduly burdensome to ISM users.

The members of the ISM community who oppose the MWCWG proposal — Arrow Pneumatics, Inc. ("Arrow") and the International

Microwave Power Institute ("IMPI") — agree with the MWCWG that WRC-79 foresaw the need to limit ISM emissions in the 61 GHz band[1] and that there currently is only limited use of the 61 GHz band by ISM devices.[2] Arrow and IMPI, however, refuse to acknowledge the need for achieving compatibility between communications technologies and ISM uses of millimeter wave frequencies. Furthermore, even if they perceived a need to achieve such compatibility, Arrow and IMPI assert that the FCC is powerless to deal with that need.

I. THE FCC HAS AMPLE AUTHORITY TO ADOPT IN-BAND ISM EMISSION LIMITS FOR THE 61.25 GHZ BAND.

Neither Arrow nor IMPI offers any support for their assertions that "the conventional interpretation and understanding of this [WRC-79] resolution was that such in-band limits, if any, would be set via international agreement and that the services to be protected were licensed radio"[3] or that "the ITU amendments adopted in 1979 ... recognize that such limits are not the province of national authorities."[4]

While the WRC-79 participants probably did not have unlicensed radio devices uppermost in their mind, there is nothing to prevent a national administration from allocating frequencies specifically for unlicensed technologies and protecting those frequencies from interfering uses of the radio spectrum. The FCC has taken such actions a number of times in the recent past and did so again with respect to the 59-64 GHz band.[5] Contrary to IMPI's view of the value of unlicensed technologies, the FCC has found that such technologies have grown in importance over the years and now represent a crucial element in the overall national information infrastructure.

---

[1] IMPI Opposition at 2; Arrow Opposition at 2.
[2] IMPI Opposition at 3; Arrow Opposition at 3.
[3] IMPI Opposition at 2.
[4] Id. at 4.
[5] See *In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314*, 8 FCC Rcd 7700 (1993); *In the Matter of Amendment of the Commission's Rules to Provide for Operation of Unlicensed NII Devices in the 5 GHz Frequency Range, ET Docket No. 96-102*; 12 FCC Rcd 1576 (1997); *Amendment of Parts 2, 15 and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications,*, 11 FCC Rcd 4481 (1995).

Similarly, and contrary to Arrow and IMPI's assertions, the Commission is not powerless to act to adopt in-band emission limits on ISM equipment operating in the 61.25 GHz band. The plain meaning of the relevant footnote to the Table of Frequency Allocations is that, unlike other ISM bands, administrations can impose limits on ISM usage of this band to protect radiocommunications. While an administration certainly can work within ITU processes to adopt emission limits with respect to this band, it is not the case that only the international community can adopt such limits.

Nothing in the ITU's Radio Regulations prevents the United States from acting on its own authority to adopt rules for ISM and radiocommunications compatibility in its own national territory. The FCC has the right — and, where necessary to serve the public interest, the obligation — to adopt rules not mandated by the ITU Radio Regulations, and otherwise to implement a regulatory system that is consistent with national priorities. Indeed, when the FCC added the 61.25 GHz ISM band to the domestic Table of Frequency Allocations, it recognized the possible need for in-band ISM emission limits and made clear that in-band emission limits for ISM devices could be adopted in the future if technical studies demonstrated that such a step would be in the public interest.[6]

It is irrelevant that, as IMPI points out, a joint CCIR-CISPR study group decided in 1994 not to recommend emission limits for the 61.25 GHz band or that, in 1992, the FCC did not impose in-band emission limits in the 2.45 GHz ISM band to accommodate DARS.[7] Neither "fact" affects the authority of the FCC to impose such limits on ISM usage of the 61.25 GHz band in the United States in 1999, when the public interest so warrants.

Moreover, in light of the Commission's public interest responsibilities, it is unlikely in the extreme that the FCC made any off-the-record commitment to IMPI, as IMPI implies, that, in exchange for IMPI's support of a draft study question, the Commission agreed "not to undertake any Notice of Inquiry or

---

[6] See *Overall Revision of the Rules Regarding Industrial, Scientific and Medical (ISM) Equipment*, Third Notice of Proposed Rulemaking, FCC 84-578, 49 Fed. Reg. 47628, ¶ 5 (1984).

[7] See IMPI Opposition at 7.

Rulemaking proceedings on compatibility issues in the 61.25 GHz band while the Study Question was pending before the ITU and IEC/CISPR."[8]

II. THE PETITION ADEQUATELY ESTABLISHES THE NEED FOR EMISSION LIMITS.

IMPI claims that MWCWG has failed to provide "hard evidence" that there is a risk of interference to unlicensed millimeter wave communications technologies from ISM equipment. IMPI seeks examples of where "ISM applications have drowned out unlicensed operation in ISM bands and asserts that none exists.[9]

IMPI's confidence, however, is misplaced. In the ISM bands in which it states unlicensed technologies similar to those proposed by MWCWG have be "thriving," Part 15 devices have had to accept significant operating constraints to "work around" the ISM equipment.[10] Microwave ovens are interfere substantially with Part 15 radios in the 2.45 GHz band. Frequency hopping spread spectrum radios can co-exist with microwave ovens only by sacrificing data during a hop that is at the same frequency as the interfering oven, then hopping elsewhere to re-transmit the packet. This avoidance technique is incompatible with high data rates.

The technologies that MWCWG companies are developing for the 59-64 GHz band will be wide-band, high-capacity technologies designed to take advantage of the full 5 GHz available. As the Commission recognized in its allocation order, this block of frequencies "offers the greatest potential for allowing the development of short-range wireless radio systems with communications capabilities approaching those now achievable only with coaxial and optical fiber cable."[11]

It does not take a crystal ball to foresee that ISM equipment operating in the middle of the bandwidth used by broadband communications devices will cause interference. When 61 GHz ISM and communications devices are

---

[8] See id. at 8.
[9] See id. at 10.
[10] In its supporting comments, Harmonix Corporation makes a case for the Commission's adopting emission limits in other ISM bands, in order to facilitate the full development of unlicensed technologies. The 61.25 GHz ISM band, however, stands on a different regulatory footing from the other ISM bands in which Part 15 devices are operating and the Commission need not consider other ISM bands in acting upon the MWCWG Petition.
[11] Id. at ¶ 14.

located proximately to one another, interference will occur and the communications device will bear the entire burden associated with that interference, unless the FCC changes the current regulations. Given the nascent stage of ISM development, it is impossible to offer communications users any certainty about where, when, and how often this situation will arise. Hence, the prospect of unrestricted ISM emissions stands as a dark cloud over the 61 GHz band.

It is the essence of sound spectrum management that the Commission not await the occurrence of an interference "train wreck" before taking action. Here the interference is foreseeable and foreseeably destructive. In these circumstances, the time is ripe to assure at least a basic level of compatibility between two interfering uses of the same frequencies, even though deployment of neither technology presently is extensive.

The Commission, moreover, can use the rulemaking process to develop full information about technical characteristics of millimeter wave communications technologies and ISM applications in the 61.25 GHz, the prospects for shielding ISM equipment, as well as other techniques to assure technical compatibility between the two uses of the spectrum. Contrary to Arrow's and IMPI's view of the rulemaking process, it is the most reliable means of developing all the "hard evidence" necessary for the Commission to make an informed decision.

CONCLUSION

When it allocated the 59-64 GHz band, the Commission made it possible for entities to develop and employ very high-bandwidth wireless products on an unlicensed basis. In this way, it ensured that end users who require modern, high capacity systems will be able to take advantage of the flexibility, innovation, and low cost that typically characterizes unlicensed operation.

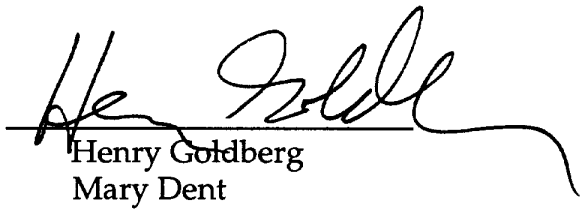
In order for the Commission's vision to become reality, it must ensure that the spectrum resource it created does not rendered unusable by unrestricted ISM emissions. Initiating a rulemaking represents a reasonable next step in this effort. In so doing, the Commission would endorse the fundamental premise that the ISM community must take reasonable steps to promote spectrum sharing in the 61 GHz band. At the same time, it would

give the ISM community an opportunity to document any respect in which the proposed rules are unreasonably burdensome.

For these reasons, the MWCWG respectfully urges the Commission promptly to initiate a rulemaking and to adopt rules that limit the in-band emissions of 61 GHz ISM devices.

Respectfully submitted,

MILLIMETER WAVE COMMUNICATIONS
WORKING GROUP



Henry Goldberg
Mary Dent

GOLDBERG, GODLES, WIENER & WRIGHT
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

Its Attorneys

June 3, 1999

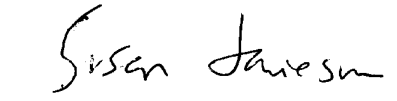
CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Reply Comments of the Millimeter Wave Communications Working Group was sent by first-class mail, postage prepaid, this 3rd day of June, 1999, to each of the following:

Terry G. Mahn
Keith A. Barritt
Fish & Richardson P.C.
601 13th Street, N.W.
Washington, D.C. 20005

Wayne Love
Vice President Technology
Arrow Pneumatics, Inc.
7730 West 96th Place
Hickory Hills, IL 60457

Mitchell Lazarus
Fletcher, Heald & Hildreth, PLC
1300 North 17th Street
11th Floor
Arlington, VA 22209/3801



/s/ Susan Jamieson
Susan Jamieson